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Technical Report 100

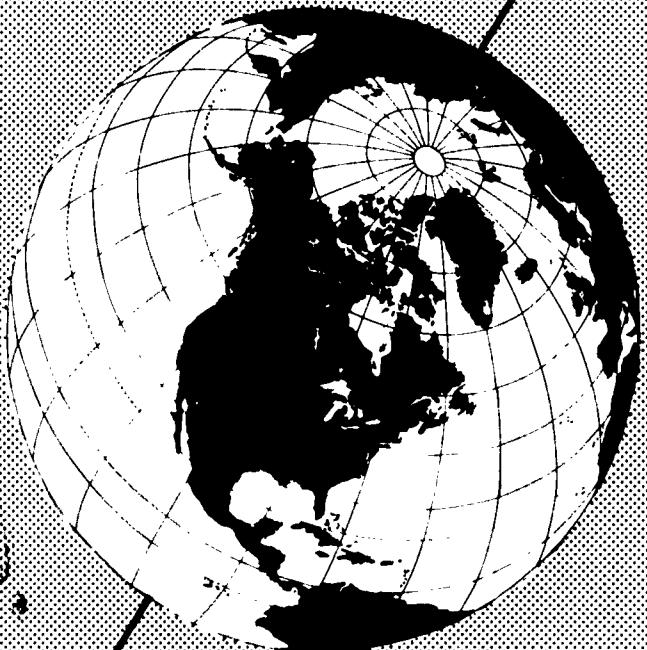
JULY, 1962

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Ground Temperature  
Observations  
Fort Yukon, Alaska

295 862

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U. S. ARMY  
COLD REGIONS RESEARCH AND  
ENGINEERING LABORATORY

Corps of Engineers

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*Technical Report 100*

JULY, 1962

**Ground Temperature  
Observations  
Fort Yukon, Alaska**

**U. S. ARMY COLD REGIONS RESEARCH  
AND ENGINEERING LABORATORY**  
Corps of Engineers  
Hanover, New Hampshire

## PREFACE

Collection of the data presented herein was authorized in July 1946 by the Chief of Engineers in the "Instructions and Outline on Meteorological Data Study." The program was initiated by the Permafrost Division, St. Paul District and continued by the Arctic Construction and Frost Effects Laboratory (ACFEL), U. S. Army Engineer Division, New England. In February 1961 ACFEL was merged into the U. S. Army Cold Regions Research and Engineering Laboratory (CRREL). The program included the collection of data at 20 stations in Alaska and one in Canada, with this report summarizing the data obtained at Fort Yukon, Alaska. The data obtained at the other stations in this program will be presented in separate reports.

The investigation was a cooperative venture of the Corps of Engineers, the United States Weather Bureau and the Federal Aviation Agency (formerly Civil Aeronautics Administration). Substantial support and assistance in the investigation were provided by personnel of the Alaska Field Station, CRREL (formerly Arctic Construction Investigation Area) at Fairbanks, Alaska. Personnel from the AFS installed and maintained the ground-temperature-measuring equipment and rendered technical assistance to the operating personnel of the U. S. Weather Bureau and Federal Aviation Agency.

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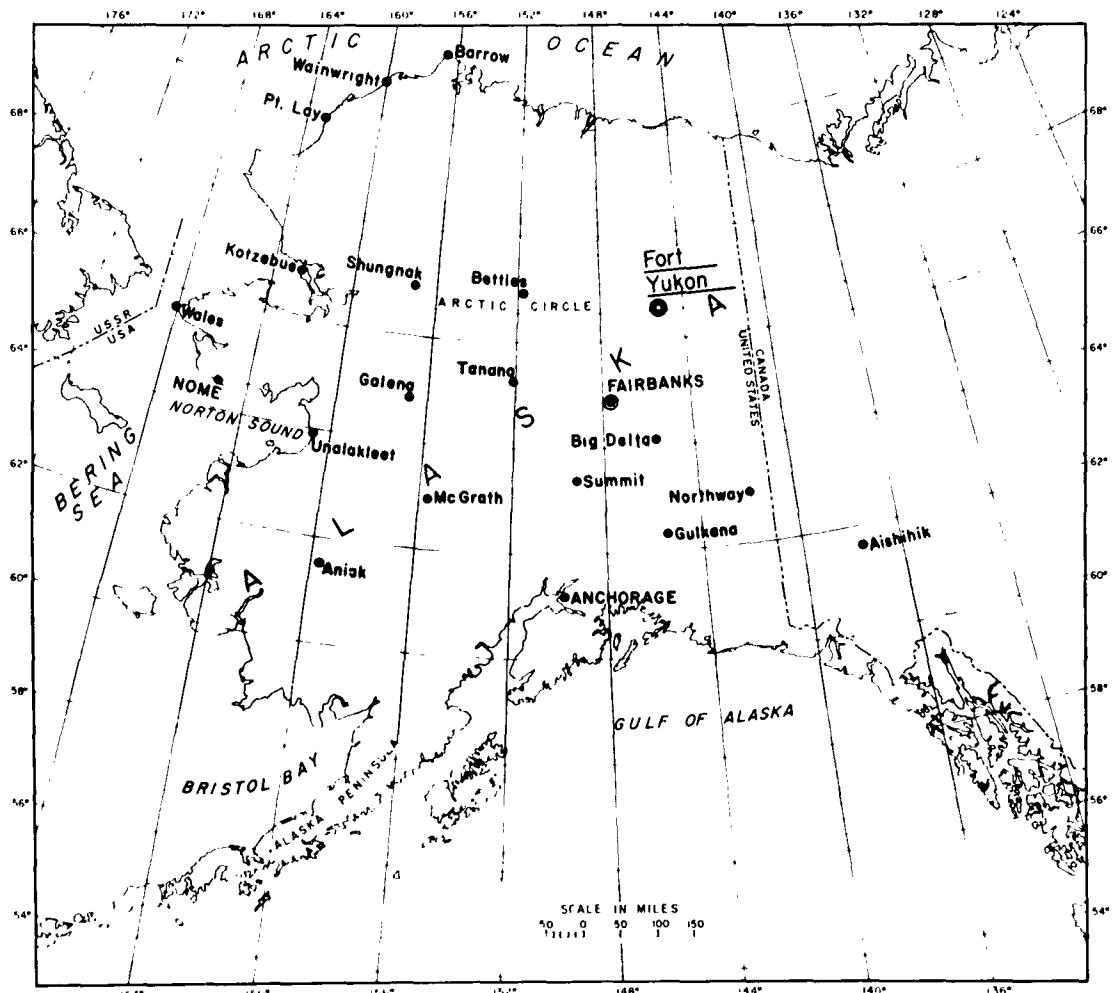
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#### SUMMARY

This report summarizes climatological, ground-temperature, and soil data obtained at Fort Yukon, Alaska. The climatological data were obtained from U. S. Weather Bureau records for the years 1928 to 1958; the ground-temperature data were obtained from daily observations during the years 1947 to 1958; and the soil data were obtained from samples taken while drilling two holes: one in July 1946 and the other in July 1958.



Ground-temperature observation sites

GROUND TEMPERATURE OBSERVATIONS,  
FORT YUKON, ALASKA

INTRODUCTION

Purpose

The Fort Yukon, Alaska, data summarized in this report were obtained in connection with an investigation to evaluate the relationship between climatic conditions, soil conditions, and soil temperatures in arctic and subarctic areas. These data could be used by agencies requiring general knowledge of this area for such purposes as site selection or as a guide in more detailed research efforts.

Scope

The investigational program involved the collection of climatological, ground-temperature, and soil data from 20 stations in Alaska and one in Canada.

The climatological data for Fort Yukon, Alaska, were obtained from U. S. Weather Bureau records for the years 1928 to 1958. Ground-temperature observations were obtained on a daily basis from 1947 to 1958 by the U. S. Federal Aviation Agency for the Arctic Construction and Frost Effects Laboratory, U. S. Army Engineer Division, New England. Soil data were obtained from samples taken during the drilling of two holes, one in July 1946 and the other in July 1958.

DESCRIPTION OF SITE

Location

Fort Yukon is a small village and trading post in east central Alaska. It is located on the north bank of the Yukon River, approximately one mile upstream from the confluence of the Yukon and Porcupine Rivers, at  $66^{\circ} 34' N$  latitude and  $145^{\circ} 18' W$  longitude (Figure 1). The only feasible access to the village is by air from Fairbanks, Alaska, 140 air miles south-southwest, or by river during the months of July through September. An unsurfaced landing strip provides year-round access to the area by air, and there are docking facilities for small boats and barges at the Northern Commercial Company.

Terrain

In the vicinity of the temperature assembly, the terrain slopes slightly, in a southerly direction, to the Yukon River 500 feet away. During the observational period, the vegetation in the general area consisted of a fairly thick, 2- to 3-ft-high growth of grass, weeds, and willow brush (Figure 2).

Climate

Climatological data for Fort Yukon are given in Table 1 and in Figures 3 and 4.

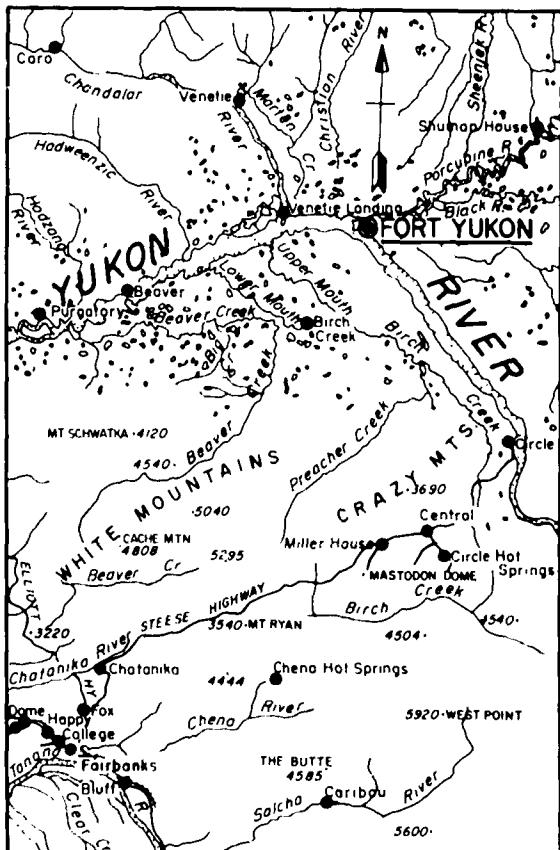


Figure 1. Vicinity map



Figure 2. Surface cover in area of ground-temperature assembly.

Table 1 gives air temperatures, precipitation, amounts of snowfall and snow cover, and the freezing and thawing indexes.

Figure 3, a climograph (also called a hythergraph), gives: mean monthly values of precipitation versus temperature; direction and force of prevailing winds; cloud cover; number of days of precipitation (rain and/or snow); and fog data for the area.

Figure 4 presents meteorological data and ground isotherms for a typical year (1951). The meteorological data includes daily air temperatures, degree days of thaw and freeze (cumulative monthly), daily precipitation (rain and/or snow) and depth of snow on the ground.

Table 1. Climatological data

for

Fort Yukon, Alaska,

1928 - 1958.

Air temperature - °F.	
Mean annual .....	20.7
Recorded high (6/25/55) .....	97
Recorded low (12/7/35) .....	-71
Precipitation - inches	
Mean annual .....	6.5
Max. annual (1944) .....	10.7
Max. monthly (Aug. 1930) .....	3.0
Snowfall - inches	
Mean annual .....	43.3
Max. annual (1948) .....	72.6
Max. monthly (Nov. 1939) .....	22.8
Freezing index (degree-days, F, below 32)	
Average (1947-1958) .....	-7484
Lowest " " .....	-6631
Highest " " .....	-8099
Thawing index (degree-days, F, above 32)	
Average (1947-1958) .....	+3110
Lowest " " .....	+2780
Highest " " .....	+3480
Average date start freeze season .....	22 Sept.
Average date start thaw season .....	24 April
Average length of freeze season (days) .....	215
Average length of thaw season (days) .....	150

Snow cover - inches  
first day of month for 1949-1958

	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Maximum recorded	2	12	21	29	36	41	46	32	0	
Minimum recorded	-	2	5	15	20	15	16	T	0	
10-Year average	T	6	13	22	26	35	30	6	0	

T = Trace

## GROUND TEMPERATURE OBSERVATIONS

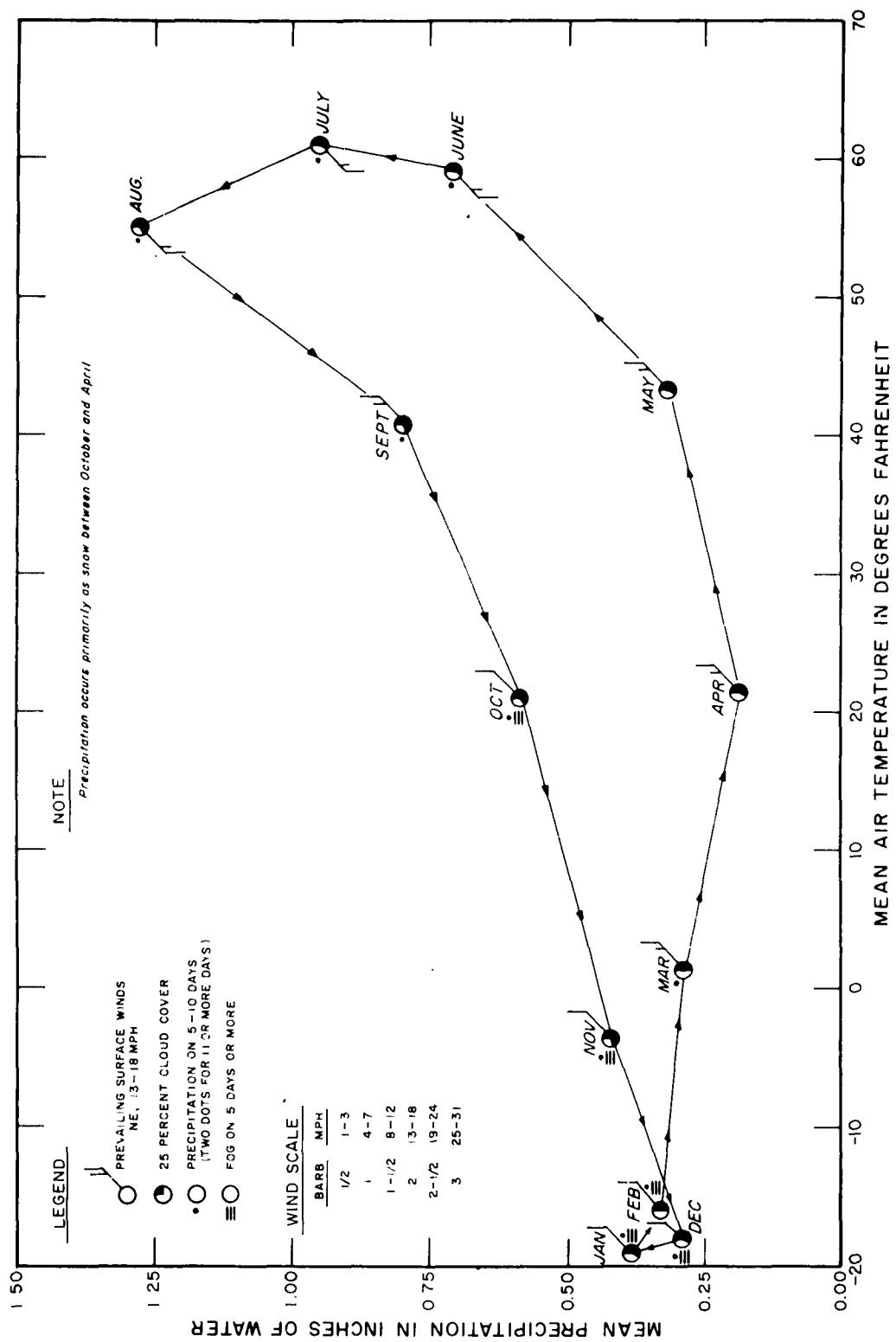
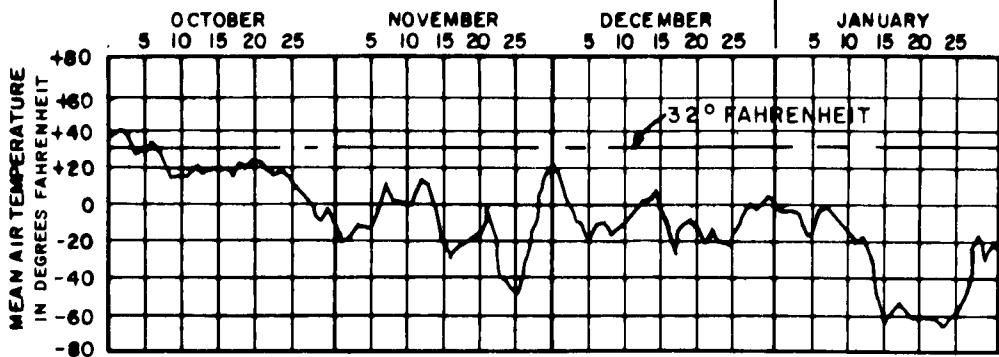
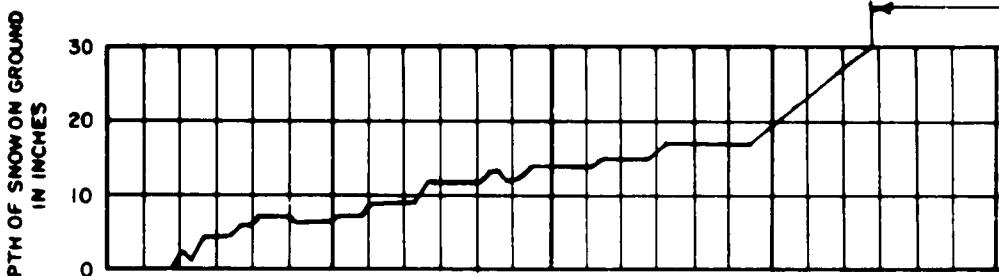
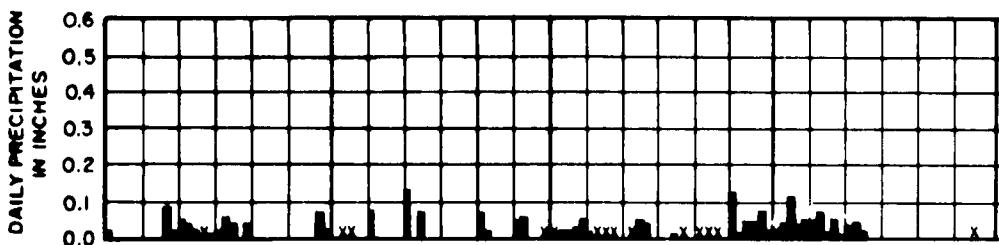


Figure 3. Climograph

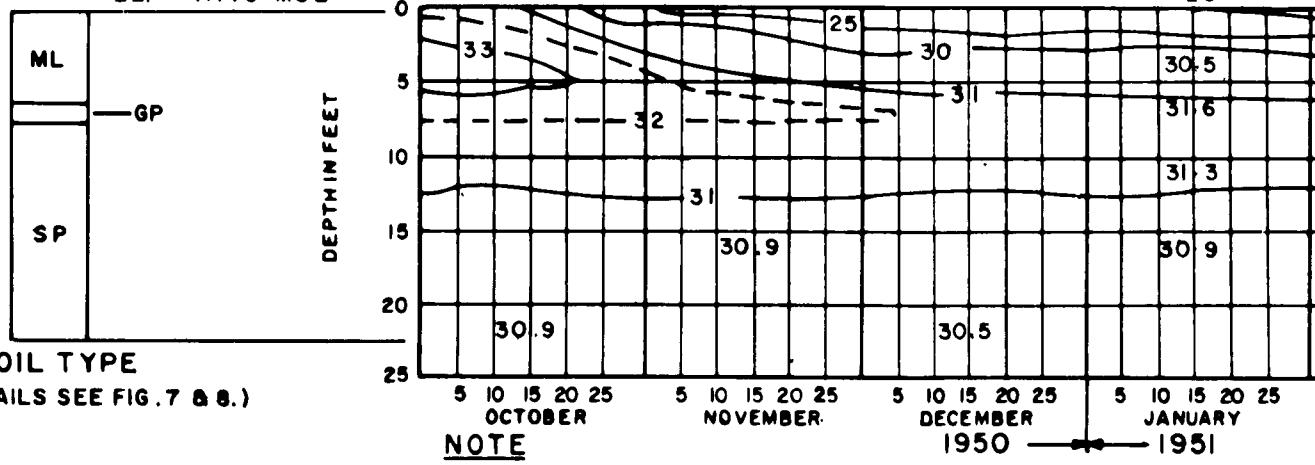
1950 - 1951



1

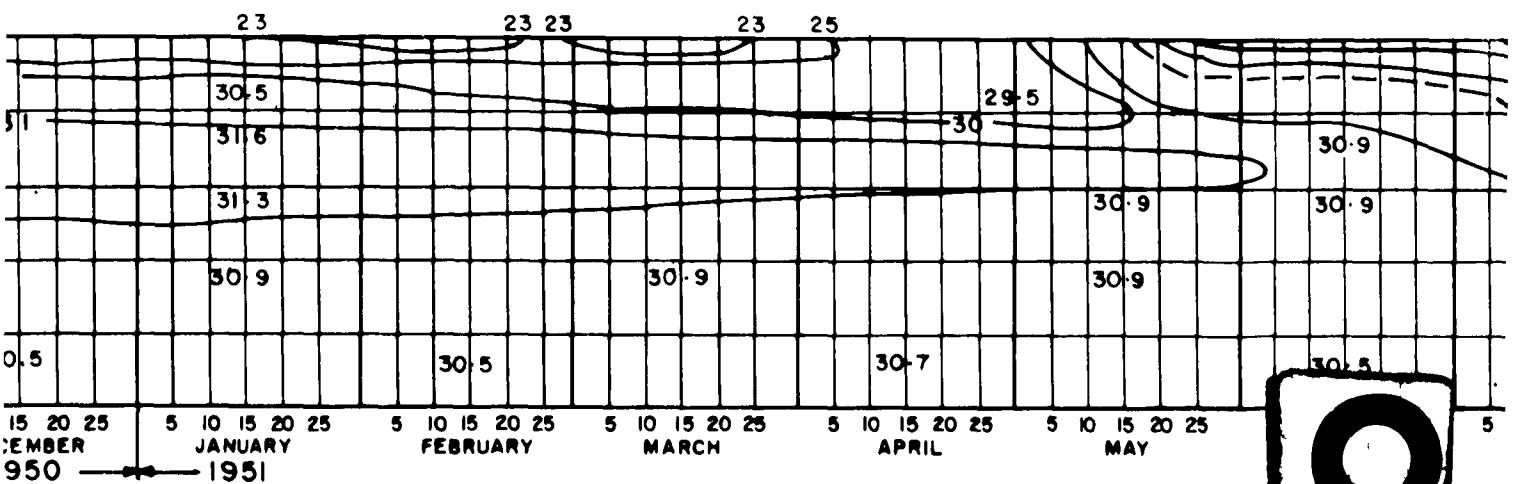
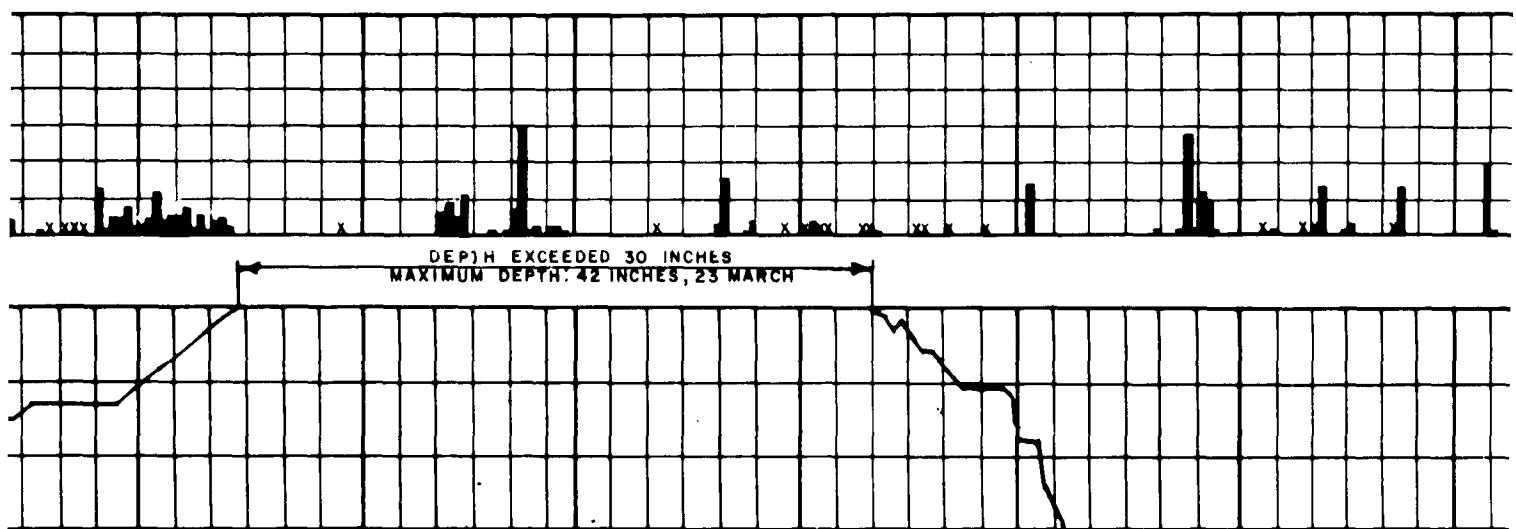
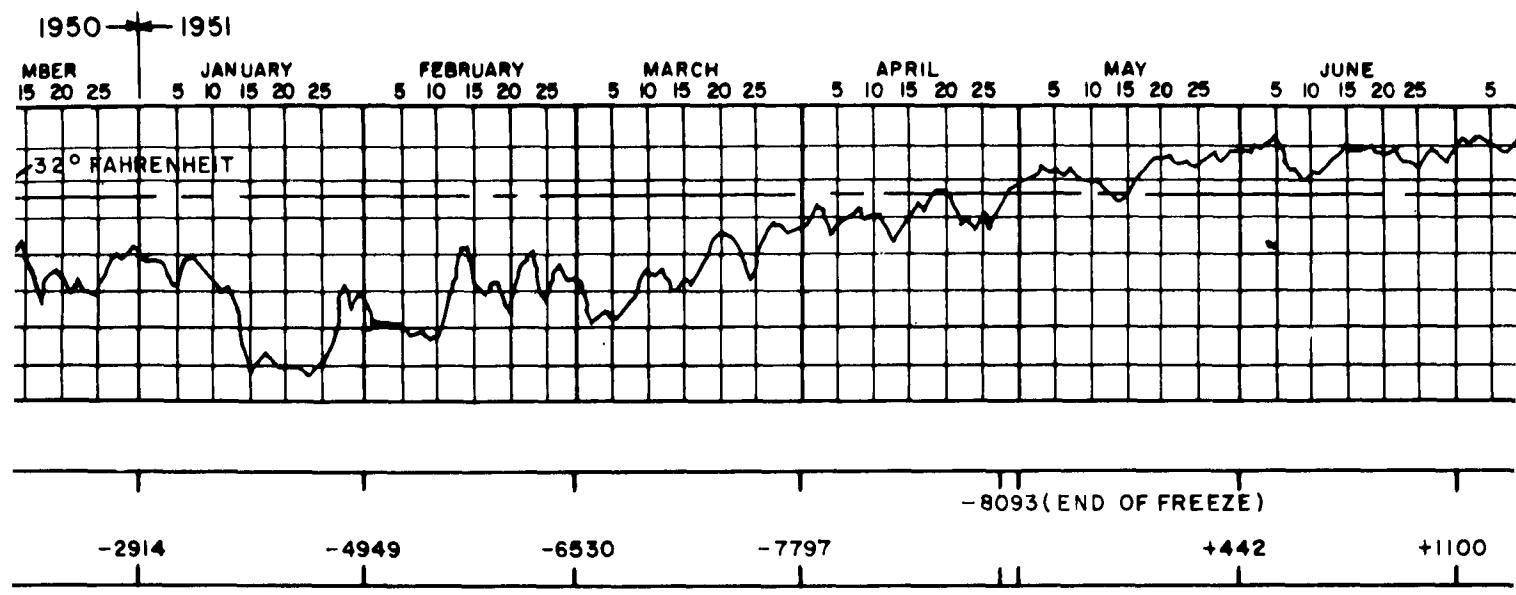


EL. = 417.0 MSL



NOTE

GROUND TEMPERATURES IN DEGREES FAHRENHEIT



2

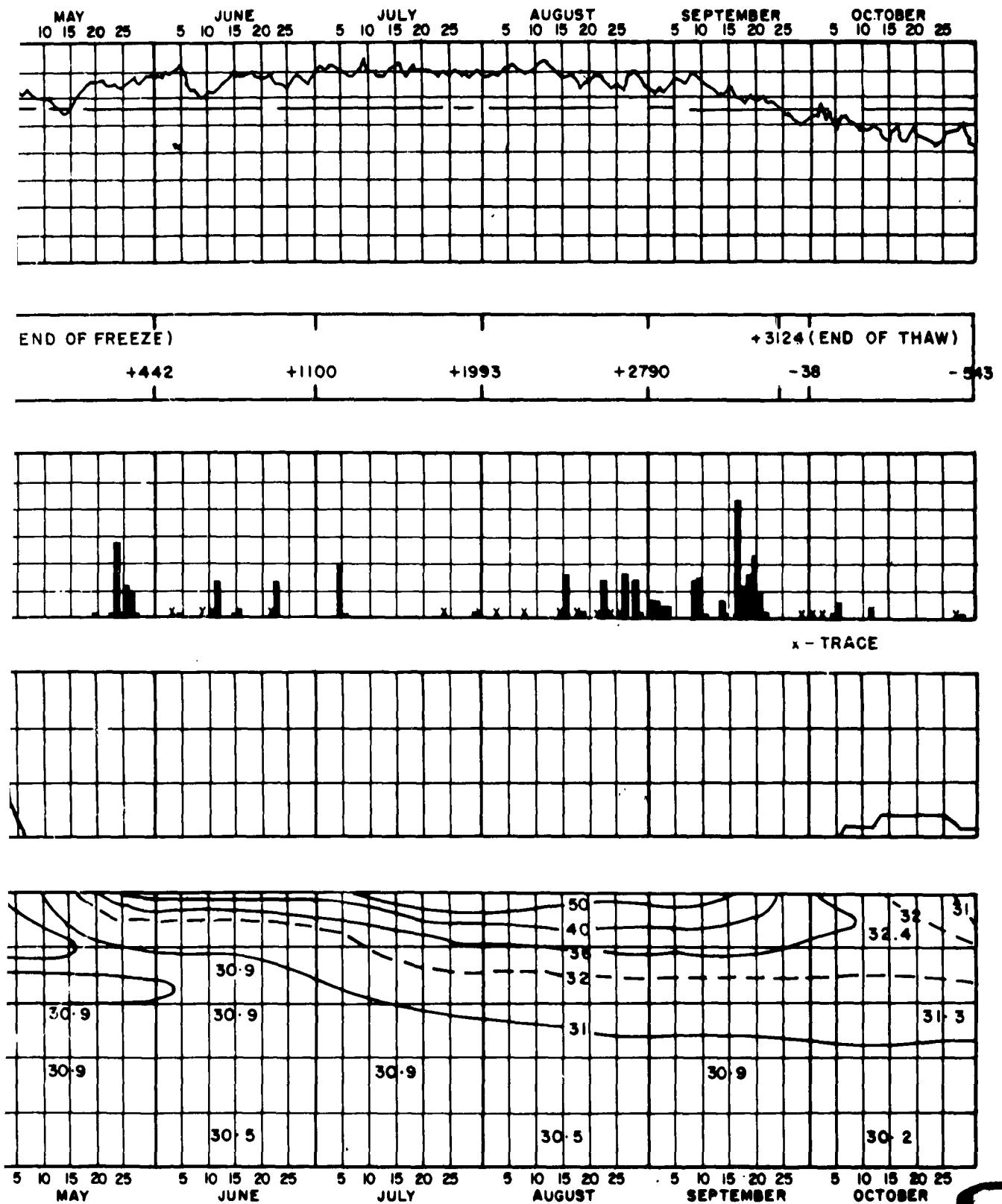


Figure 4. Meteorological Data and Ground Isotherms

## GROUND-TEMPERATURE ASSEMBLY

Location

The ground-temperature assembly at Fort Yukon, Alaska is 122 feet northeast of the Federal Aviation Agency (FAA) quarters and control building and 500 feet north of the Yukon River (Fig. 5.) Surface drainage from the immediate area flows directly toward the temperature assembly from the west and south.

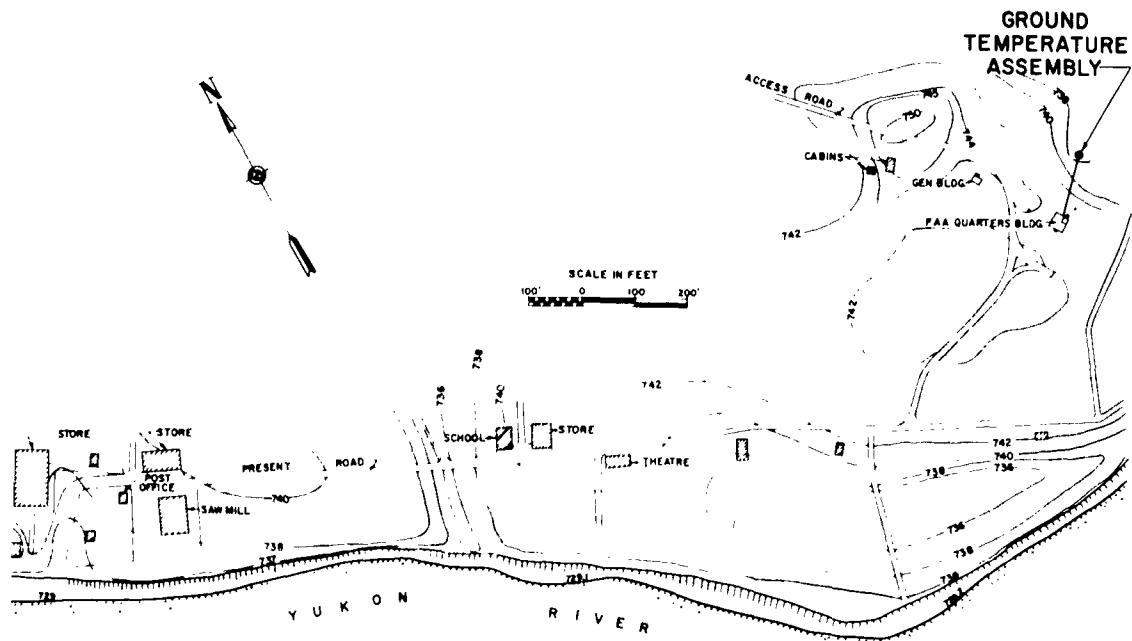


Figure 5. Site location.

The location of the temperature assembly in such close proximity to the Yukon River should be considered when interpreting the ground-temperature data, as it is possible that ground temperatures will vary considerably as the distance from the river increases.

Drilling the temperature well

Drilling operations began on 11 July 1946. The first hole attempted had to be abandoned after drilling to a depth of 6.4 feet, as gravel with cobbles up to 3 inches in diameter was encountered at that depth. A new location was chosen for a second attempt; drilling at that location was successful, although considerable difficulty was experienced in penetrating frozen gravel and sand. By a combination of water jetting and driving, a 22.5-ft-deep temperature well was completed on 14 July.

Instrumentation

The ground-temperature-measuring equipment installed at Fort Yukon consisted of nine copper resistance thermometers (thermohms); the three top thermohms were enclosed in 3/4-in.-diam tubing and the other six were suspended in a 2-in.-diam oil-filled pipe. The thermohms extended from 0.0 to 22.0 ft below the ground surface, spaced as shown in Figure 6. It should be noted that the 0.0-ft thermohm is actually 1/8-inch to 1/4-inch below the ground surface.

Temperature observations were made with a Leeds and Northrup Model 8015-S temperature indicator; it was a double range, Wheatstone-bridge type with one scale range of -50°C to -5°C and one of -15°C to +30°C.

## GROUND TEMPERATURE OBSERVATIONS

Resistance thermometers were used instead of thermocouples because similar equipment had been used previously by the U. S. Weather Bureau and station personnel were familiar with the observational procedure. Also, the use of thermocouples would have necessitated the daily preparation of an ice bath for reference use, which is not practical when observations are obtained only in a single temperature well.

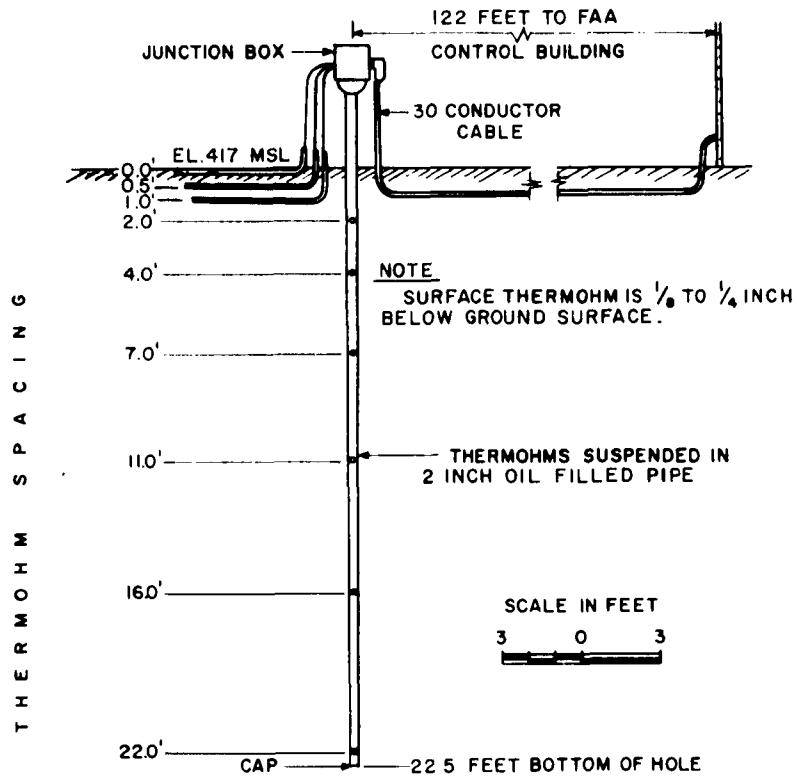


Figure 6. Resistance Thermometer Installation.

## SOIL INVESTIGATIONS

Exploration

In conjunction with drilling operations for the temperature well, representative soil samples were obtained with a 4-in. hand auger after each drill run. During a field trip to the site to remove equipment on 23 July 1958, a 7-ft-deep exploratory hole was drilled 6 feet east of the temperature well. The exploratory drilling was performed by drive sampling with a Chicago pneumatic drill rig equipped with a 200-lb drop weight. A 3-in.-diam hardened steel drive tube was used as the sampler. Attempts to drive through the frozen gravelly sands beyond a 7-ft depth resulted in refusal and buckling of the sample tube.

Soil data

Laboratory tests were performed to identify and classify the soil samples obtained, with moisture content and density tests made on suitable representative samples. The boring log and soil data for the temperature well are shown in Figure 7, and the log and soil data for the exploratory hole are shown in Figure 8.

## GROUND TEMPERATURES

Observed ground temperatures

Ground temperatures were recorded daily at Fort Yukon for 12 years (1947 to 1958). The maximum, minimum, and the average of the temperatures recorded the first day of each month are shown in Table 2. The actual ground temperatures recorded the first day of each month for the 1947-1958 period of observations are shown in Table 3.

Ground-temperature gradients

Ground-temperature gradients for a typical thaw and freeze season (1951-1952) at Fort Yukon are shown in Figure 9. Gradients were plotted for the end-of-thaw, mid-thaw, mid-freeze and end-of-freeze. The maximum and minimum ground temperatures recorded at each depth during the period of record are also presented.

The end-of-thaw gradient indicates the maximum depth of thaw for the 1951 thawing season; the end-of-freeze gradient shows the minimum subsurface temperatures recorded (at depths greater than 4 feet) for the freezing season. It should be noted that the maximum and minimum temperatures shown for the various depths do not represent the 1951-1952 season as do the gradients; rather, they are the maximum and minimum temperatures recorded at each depth during the years 1947 to 1958.

Depth to permafrost

The seasonal depth of thaw at Fort Yukon varied slightly from year to year; the average seasonal depth of thaw observed during the period of record (1947-1958) was approximately 7.5 feet below the ground surface.

When the ground-temperature well was drilled on 14 July 1946, frozen ground (permafrost) was encountered at a depth of 5.2 feet (Fig. 7). A hand augered hole drilled on 12 August 1949 reached frozen ground 7.5 feet below the surface. On 23 August 1958, an exploration hole was drilled as close as was physically possible (6.0 feet east) to the ground-temperature assembly, and frozen ground was encountered 6.2 feet below the ground surface, (Fig. 8).

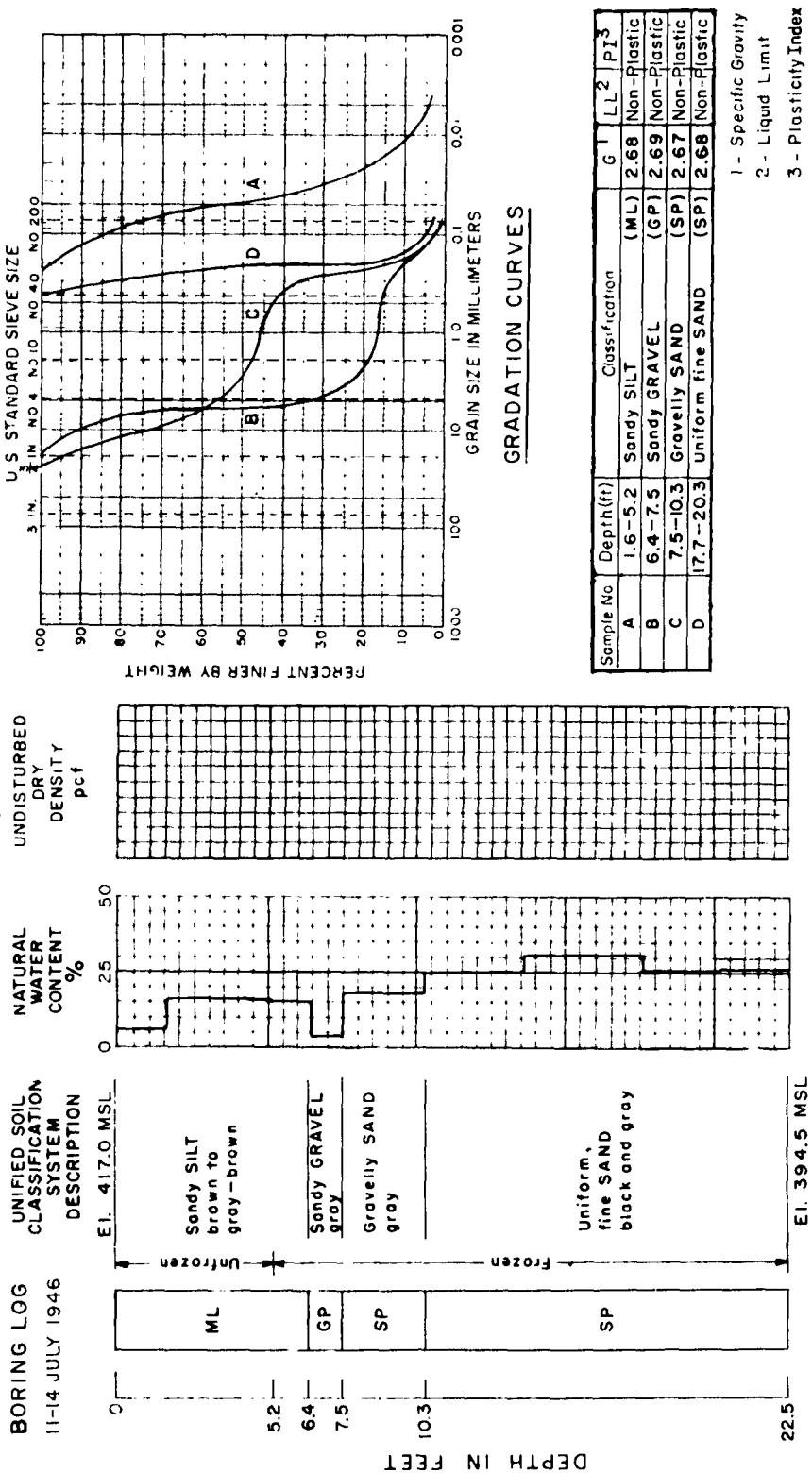


Figure 7. Boring Log and Soil Data, Ground Temperature Well, Fort Yukon, Alaska

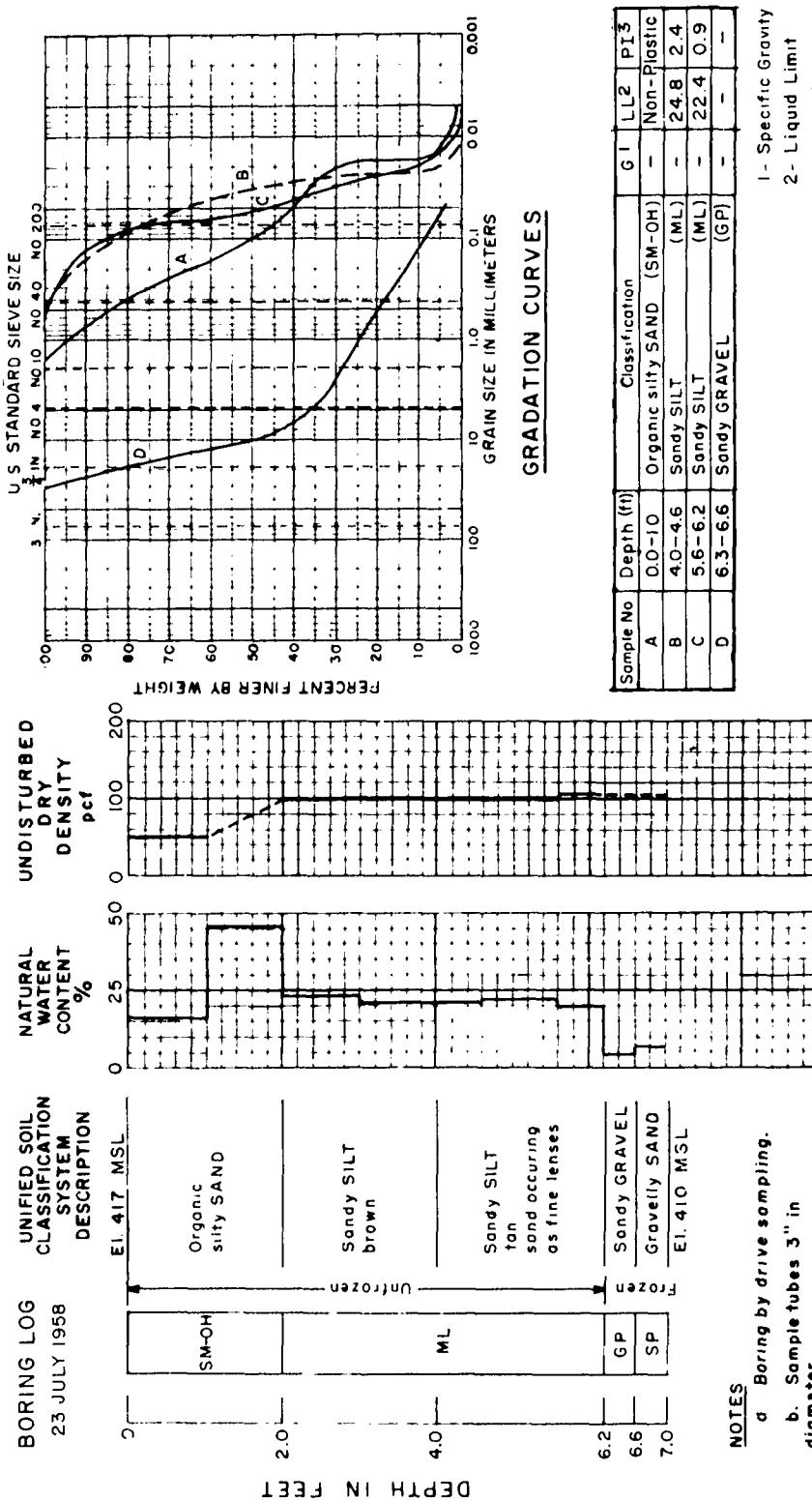


Figure 8. Boring Log and Soil Data, Exploratory Hole, Fort Yukon, Alaska

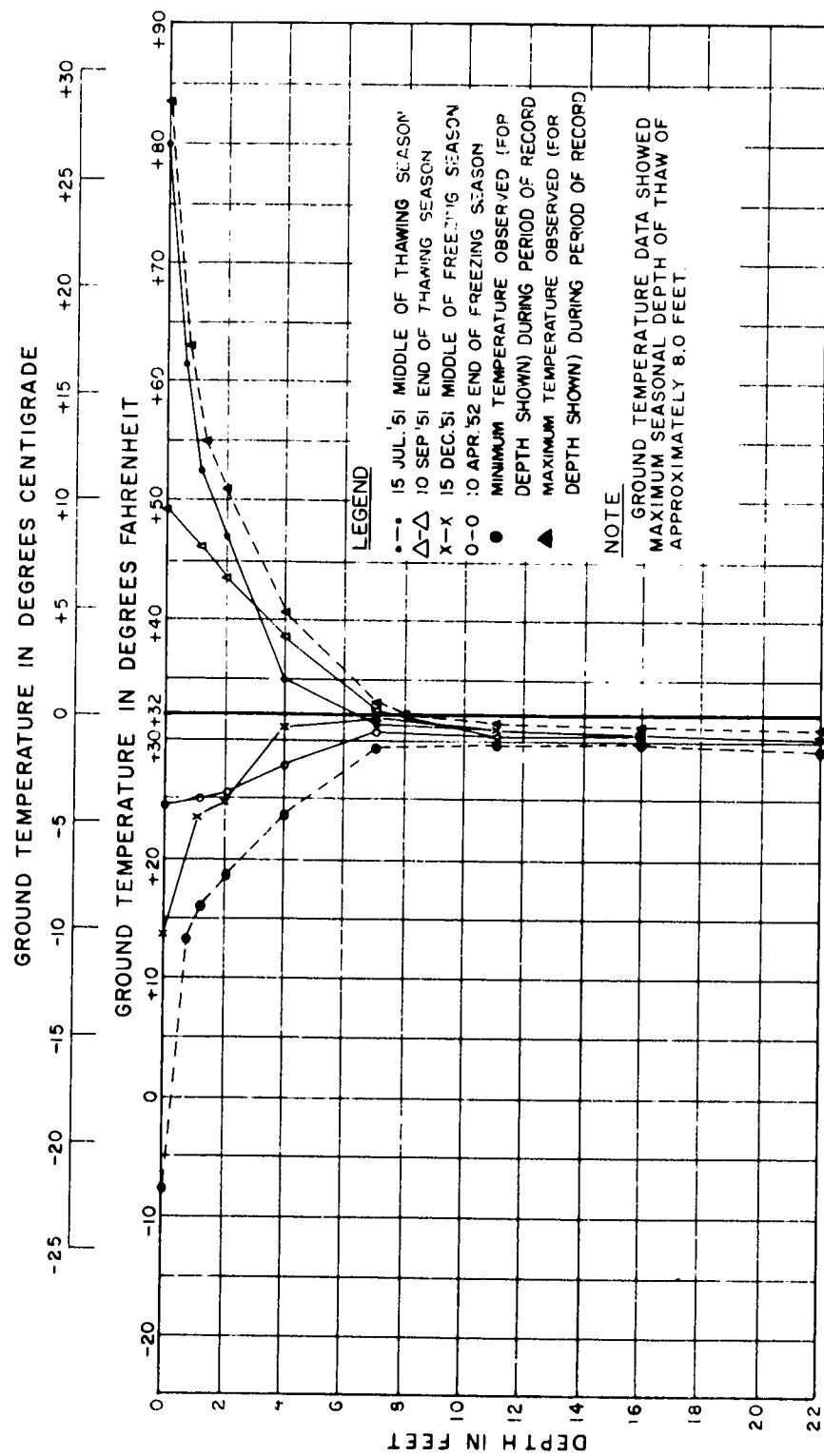


Figure 9. Ground - Temperature Gradients

## GROUND TEMPERATURE OBSERVATIONS

11

Table 2. Ground temperatures, °F. Maximum, minimum, and average observed first day of month, 1947 - 1958.

\* Thermohm installed  $\frac{1}{8}$  inch to  $\frac{1}{4}$  inch below ground surface.

DEPTH IN FEET	MONTH																			
	JULY			AUG.			SEPT.			OCT.			NOV.			DEC.				
	MAX.	MIN.	AVG.	MAX.	MIN.	Avg.	MAX.	MIN.	Avg.	MAX.	MIN.	Avg.	MAX.	MIN.	Avg.	MAX.	MIN.	Avg.		
0.0*	75.9	54.7	68.0	77.0	55.0	60.8	60.4	40.6	50.4	38.1	18.7	30.2	28.0	15.8	23.4	26.9	10.4	20.8		
0.5	69.8	43.9	50.9	54.7	44.2	49.1	53.6	28.5	42.8	39.9	25.9	30.7	31.3	18.9	26.6	29.8	21.9	24.4		
1.0	55.0	43.5	48.7	54.0	46.4	49.3	47.8	40.6	44.8	37.4	30.2	33.4	31.6	27.3	30.2	31.5	18.1	27.9		
2.0	47.1	39.6	43.5	50.4	45.7	47.1	45.7	41.0	42.4	39.2	29.8	33.5	31.3	26.2	29.8	30.5	23.7	27.9		
4.0	33.8	30.2	32.2	39.9	30.9	38.8	39.2	35.8	38.6	37.7	28.8	33.4	31.6	28.4	31.3	31.6	29.8	30.9		
7.0	31.1	29.8	30.5	32.7	29.8	31.3	32.7	30.5	32.2	33.8	30.2	32.0	32.0	30.9	31.6	32.0	30.5	31.5		
11.0	31.3	29.8	30.7	30.9	29.8	30.5	30.9	29.8	30.5	31.6	29.8	30.7	31.3	28.8	30.5	30.9	30.2	30.7		
16.0	30.9	30.2	30.5	30.9	30.2	30.5	31.3	29.8	30.5	31.3	30.2	30.7	31.1	30.2	30.5	30.9	28.6	30.4		
22.0	31.3	30.2	30.5	30.9	30.2	30.5	30.9	29.8	30.5	31.6	29.8	30.5	31.1	29.8	30.5	30.9	29.3	30.4		

## GROUND TEMPERATURE OBSERVATIONS

TABLE 3  
GROUND TEMPERATURES IN DEGREES FAHRENHEIT  
RECORDED FIRST DAY OF MONTH, 1947-1958

1947												1948													
DEPTH IN FEET	1947											1948													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
0.0	*	13.3	21.9	22.3	29.5	13.9	69.8	156.5	156.5	30.9	27.7	26.9	0.0	21.4	21.1	14.7	22.8	31.6	66.9	70.2	62.6	14.6	29.5	25.9	
0.5	*	18.3	23.4	21.8	28.8	18.1	17.8	152.2	13.7	31.6	30.9	29.8	0.5	28.0	27.0	22.3	25.1	31.6	146.4	50.4	50.0	39.6	32.4	31.3	
1.0	*	20.5	21.6	25.1	28.0	31.2	13.5	50.0	13.7	30.9	31.6	30.5	1.0	29.5	28.4	24.8	25.3	31.1	141.4	49.3	50.4	42.8	33.0	31.3	
2.0	*	21.6	21.8	25.1	28.0	30.2	39.6	146.0	11.0	30.9	31.3	30.5	2.0	29.5	27.7	25.5	26.4	33.1	144.6	17.1	14.7	33.6	31.1	26.6	
4.0	*	29.1	28.4	28.4	28.4	29.3	30.2	35.2	35.8	30.9	31.3	31.5	4.0	31.3	30.7	30.5	29.7	29.8	30.2	33.8	39.9	38.8	24.3	31.6	31.3
7.0	*	31.6	31.3	30.9	30.2	29.8	29.8	29.8	29.8	30.2	30.9	30.5	7.0	31.3	30.9	30.5	30.9	30.9	29.8	30.2	32.7	31.6	31.1	31.6	
11.0	*	30.5	30.5	30.5	30.5	30.0	29.8	29.8	29.8	30.2	30.5	30.5	11.0	30.5	30.2	30.5	30.5	30.4	30.4	30.4	30.5	30.5	30.5	30.9	
16.0	*	30.2	30.2	30.5	30.5	30.2	30.2	30.2	30.2	30.2	30.2	30.2	16.0	30.5	29.7	30.2	30.5	30.4	30.2	30.2	30.5	30.5	30.5	30.5	
22.0	*	30.4	30.5	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.8	22.0	29.8	29.8	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.4	

1949												1950													
DEPTH IN FEET	1949											1950													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
0.0	*	9.7	18.3	15.8	21.6	23.0	*	*	*	60.4	36.3	23.0	16.9	0.0	10.6	22.5	15.1	24.1	29.8	52.5	75.9	64.4	55.7	38.1	20.5
0.5	17.9	21.6	19.0	23.7	24.4	*	*	*	53.6	39.9	28.0	23.7	0.5	20.1	25.1	19.8	25.5	27.7	25.5	55.7	49.6	44.3	35.4	26.6	26.6
1.0	21.9	23.4	20.1	24.4	25.1	*	*	*	17.8	36.7	31.3	28.0	1.0	21.8	26.8	22.3	26.2	28.4	36.7	45.3	45.3	37.4	30.9	28.8	
2.0	22.6	24.4	22.3	24.4	24.8	*	*	*	45.7	39.2	30.9	28.6	2.0	23.9	26.6	23.7	25.5	28.8	32.0	44.6	43.9	36.7	29.8	29.1	
4.0	30.2	29.1	28.0	28.0	28.0	*	*	*	38.8	37.7	31.6	31.6	4.0	30.9	30.5	29.5	29.5	30.2	31.6	30.9	39.2	35.6	32.0	31.3	
7.0	31.5	31.3	30.9	30.9	29.5	*	*	*	31.6	33.8	31.6	31.6	7.0	31.6	31.6	31.6	31.6	31.6	30.9	30.9	31.6	31.3	31.6	31.6	
11.0	30.9	30.9	30.9	30.9	30.9	*	*	*	30.5	31.6	30.9	30.5	11.0	31.1	31.1	31.3	30.9	30.9	30.9	30.9	31.3	30.9	30.9	30.9	
16.0	30.9	30.9	30.9	30.9	30.9	*	*	*	30.5	31.3	30.5	30.7	16.0	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	
22.0	30.5	30.4	30.4	30.2	30.9	30.4	*	*	30.5	31.6	30.5	30.7	22.0	30.5	30.5	30.5	30.5	30.5	30.2	30.5	30.5	30.5	30.5	30.5	

\*Defective equipment

TABLE 3 (CONT'D)  
GROUND TEMPERATURES IN DEGREES FAHRENHEIT  
RECORDED FIRST DAY OF MONTH, 1947-1958

1951												1952													
DEPTH IN FEET	1951											1952													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
0.0	25.5	20.8	23.0	26.6	30.5	60.1	74.1	70.2	45.0	29.5	23.4	21.4	0.0	20.7	19.9	21.6	23.0	31.1	63.7	69.1	56.5	50.4	18.7	27.3	23.0
0.5	26.6	23.0	23.7	26.2	28.8	12.8	52.2	50.7	42.8	30.2	24.8	23.2	0.5	21.2	20.7	21.2	23.0	29.8	39.2	50.4	44.3	43.2	26.6	28.0	23.4
1.0	28.0	25.5	25.5	27.0	28.4	11.2	50.0	51.4	46.4	30.2	28.8	27.0	1.0	27.5	23.2	23.0	24.4	29.5	37.0	49.3	45.3	32.0	29.8	27.3	
2.0	28.0	24.4	25.5	27.3	29.1	33.4	43.2	47.5	43.9	29.8	29.8	27.0	2.0	23.1	22.6	23.4	23.7	28.8	32.0	43.2	46.0	42.2	20.2	28.4	
4.0	30.9	30.5	29.8	29.5	29.5	30.2	31.3	38.8	39.2	28.8	31.6	30.9	4.0	30.5	28.9	28.0	27.7	28.1	29.5	30.2	37.7	37.7	30.2	20.9	30.5
7.0	31.6	31.6	31.6	31.3	31.3	30.9	30.9	31.6	31.3	31.6	31.6	31.5	7.0	31.3	31.5	31.6	30.9	30.5	30.5	29.8	30.5	30.5	30.2	30.5	
11.0	30.9	31.3	31.1	31.1	30.9	30.9	30.9	30.5	30.9	31.3	31.3	30.9	11.0	30.4	30.7	30.9	30.9	30.5	30.5	29.8	30.2	30.2	30.2	30.2	
16.0	30.9	30.5	31.3	31.3	30.9	30.9	30.9	30.5	30.5	30.5	30.9	30.0	16.0	30.4	30.4	30.9	30.5	30.5	30.2	30.2	30.5	30.5	30.5		
22.0	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.2	30.2	30.7	22.0	30.5	30.5	30.5	30.2	30.5	30.5	30.2	30.5	30.2	30.2		
1953												1954													
DEPTH IN FEET	1953											1954													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
0.0	22.3	12.9	20.5	21.9	29.8	66.6	54.7	77.0	51.1	30.2	15.8	13.6	0.0	19.8	16.2	21.2	*	*	62.2	72.0	61.2	51.8	31.6	28.0	22.6
0.5	24.4	16.9	21.6	21.9	29.8	15.7	16.0	54.7	44.6	28.8	18.9	18.1	0.5	20.3	17.6	15.1	*	*	42.5	62.2	47.1	41.7	25.9	29.8	23.4
1.0	27.7	21.0	23.7	30.5	30.5	12.4	17.5	54.0	40.6	31.2	27.3	23.7	1.0	21.6	20.5	19.4	*	*	40.3	55.0	48.6	46.4	33.4	29.8	28.0
2.0	27.7	19.0	23.7	30.2	30.2	35.6	43.9	50.4	43.5	32.7	26.2	24.8	2.0	21.9	20.3	26.4	*	*	35.2	47.1	45.7	44.2	34.5	30.2	28.4
4.0	20.9	29.5	28.8	27.7	29.1	29.5	31.3	38.8	39.2	31.5	28.4	30.7	4.0	27.9	26.9	31.3	*	*	28.5	33.0	37.7	39.2	34.2	31.6	30.2
7.0	31.6	31.6	31.6	31.3	31.3	30.5	30.5	30.9	30.5	32.7	32.4	31.5	7.0	31.5	31.3	31.1	*	*	30.2	30.5	31.6	31.6	32.0	31.6	
11.0	31.3	30.9	30.9	30.9	30.9	30.5	30.5	30.9	30.5	30.5	30.9	30.9	11.0	28.4	25.5	31.1	*	*	30.9	30.9	30.9	30.9	30.5	30.5	
16.0	30.2	30.9	30.9	30.9	30.9	30.5	30.5	30.9	30.5	30.5	30.5	30.5	16.0	30.2	30.2	30.9	*	*	30.9	30.9	30.9	30.9	30.5	30.5	
22.0	30.9	30.9	30.9	30.9	30.9	30.5	30.5	30.5	30.5	30.5	30.5	30.2	22.0	29.7	30.2	30.2	*	*	30.9	30.9	30.9	30.9	30.5	30.5	

TABLE 3 (CONT'D)  
GROUND TEMPERATURES IN DEGREES FAHRENHEIT  
RECORDED FIRST DAY OF MONTH, 1947-1958

1955												
DEPTH IN FEET	1956											
	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
0.0	18.0	20.8	20.1	23.4	31.7	*	*	*	14.6	31.6	17.6	21.2
0.5	20.5	20.8	22.6	23.0	24.8	*	*	*	39.9	30.9	21.2	23.4
1.0	24.8	24.4	22.3	24.4	26.2	*	*	*	43.5	34.2	29.3	27.7
2.0	23.0	21.8	22.6	23.7	27.3	*	*	*	42.4	34.9	28.4	27.3
4.0	30.5	29.8	28.4	28.4	28.4	*	*	*	39.2	35.2	32.0	31.3
7.0	31.6	31.6	31.6	31.3	31.3	*	*	*	32.7	32.4	32.0	32.0
11.0	30.9	30.5	30.9	30.9	31.6	*	*	*	30.9	31.3	31.1	30.9
16.0	30.9	30.5	30.9	30.9	31.3	*	*	*	30.9	31.3	31.1	30.9
22.0	30.9	30.5	30.5	30.5	31.3	*	*	*	30.9	30.9	31.1	30.9

1957												
DEPTH IN FEET	1958											
	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
0.0	*	*	23.4	28.0	48.2	56.5	59.7	52.5	25.1	22.8	21.2	0.0
0.5	*	*	23.7	28.8	35.6	43.9	45.0	38.5	27.3	26.9	23.1	0.5
1.0	*	*	25.1	29.5	35.2	45.0	46.4	47.1	32.7	31.3	29.8	1.0
2.0	*	*	25.5	28.0	32.0	40.6	47.1	45.0	33.1	31.1	29.1	2.0
4.0	*	*	29.8	29.5	29.5	33.8	38.8	39.2	34.2	31.6	30.5	4.0
7.0	*	*	31.6	31.6	30.5	30.5	30.9	32.7	30.2	32.0	31.6	7.0
11.0	*	*	30.9	30.5	30.5	30.5	30.5	30.5	30.9	28.8	30.2	11.0
16.0	*	*	30.5	30.9	30.9	30.5	30.5	30.5	30.5	30.5	30.5	16.0
22.0	*	*	30.9	30.5	30.9	30.5	30.9	30.2	30.5	30.2	30.5	22.0

AD	UNCLASSIFIED	Accession No.	AD	UNCLASSIFIED
U. S. Army Cold Regions Research and Engineering Laboratory, Corps of Engineers, Hanover, N. H.	1. Soil temperatures-- Alaska	U. S. Army Cold Regions Research and Engineering Laboratory, Corps of Engineers, Hanover, N. H.	1. Soil temperatures-- Alaska	U. S. Army Cold Regions Research and Engineering Laboratory
GROUND TEMPERATURE OBSERVATIONS AT FORT YUKON, ALASKA -	1. U. S. Army Cold Regions Research and Engineering Laboratory	GROUND TEMPERATURE OBSERVATIONS AT FORT YUKON, ALASKA -	1. U. S. Army Cold Regions Research and Engineering Laboratory	U. S. Army Cold Regions Research and Engineering Laboratory
Technical Report 100, July 1962, 14p-illus. -tables. Military Construction Investigations Program		Technical Report 100, July 1962, 14p-illus. -tables. Military Construction Investigations Program		
Summaries are presented of (1) ground temperature data at 9 depths from 0-0-22.0 ft collected daily at Fort Yukon (Alaska) during 1947-58, (2) comparative climatological data collected by the U. S. Weather Bureau for the years 1928-58, and (3) soil data from samples obtained in July 1946 and July 1958. Tables are given of (1) the mean or average climatological data, (2) the maximum, minimum, and average ground temperatures for the 12 years as determined from data recorded on the first day of each month, and (3) the ground temperatures recorded the first day of each month during the 1947-58 period. Ground-temperature gradients for a typical thaw and freeze season (1951-52) are graphed and the max. and min. temperatures recorded at each depth are also presented. Seasonal thawing varied slightly from year to year (over)		Summaries are presented of (1) ground temperature data at 9 depths from 0-0-22.0 ft collected daily at Fort Yukon (Alaska) during 1947-58, (2) comparative climatological data collected by the U. S. Weather Bureau for the years 1928-58, and (3) soil data from samples obtained in July 1946 and July 1958. Tables are given of (1) the mean or average climatological data, (2) the maximum, minimum, and average ground temperatures for the 12 years as determined from data recorded on the first day of each month, and (3) the ground temperatures recorded the first day of each month during the 1947-58 period. Ground-temperature gradients for a typical thaw and freeze season (1951-52) are graphed and the max. and min. temperatures recorded at each depth are also presented. Seasonal thawing varied slightly from year to year (over)		
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U. S. Army Cold Regions Research and Engineering Laboratory, Corps of Engineers, Hanover, N. H.	1. Soil temperatures-- Alaska	U. S. Army Cold Regions Research and Engineering Laboratory, Corps of Engineers, Hanover, N. H.	1. Soil temperatures-- Alaska	U. S. Army Cold Regions Research and Engineering Laboratory
GROUND TEMPERATURE OBSERVATIONS AT FORT YUKON, ALASKA -	1. U. S. Army Cold Regions Research and Engineering Laboratory	GROUND TEMPERATURE OBSERVATIONS AT FORT YUKON, ALASKA -	1. U. S. Army Cold Regions Research and Engineering Laboratory	U. S. Army Cold Regions Research and Engineering Laboratory
Technical Report 100, July 1962, 14p-illus. -tables. Military Construction Investigations Program		Technical Report 100, July 1962, 14p-illus. -tables. Military Construction Investigations Program		
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year; the average seasonal depth of thaw was approx. 7.5 ft. below the ground surface.

year; the average seasonal depth of thaw was approx. 7.5 ft. below the ground surface.